AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) Injector for use as a fuel injection valve of motor vehicles, comprising a piezoelectric actor body having a jacket surface surrounded by an injector housing, ~~maintaining~~ so that an intermediate space ~~and~~ is defined between said jacket surface and said injector housing, said actor body being cooled by direct contact with an inert fluid which does not conduct electricity,

wherein ~~in the injector housing a fluid~~ said intermediate space is formed filled with the inert fluid, which is a heat coupling fluid, except for an air reservoir, ~~whereby~~ so that the actor body is in direct contact with the fluid over at least part of its length, the fluid removing ~~which removes the actor~~ heat from the actor body in a lateral direction from the actor body, and ~~whereby~~ so that the volume of the air reservoir is at least as large as to allow the expansion of the heat coupling fluid which occurs at the highest operating temperature of the actor body.

2. (previously presented) Injector according to Claim 1, wherein

the space forms at least a part of the fluid area and is filled over at least part of its length with the fluid and in the injector housing a separation facility is provided in the area of a valve-side end of the actor housing so that it seals the fluid-filled part of the fluid space against a space adjacent to the injector valve in the injector housing.

3. (currently amended) Injector according to Claim 2, wherein

the actor body is ~~incorporated into~~ within a tubular spring located in the space and is pretensioned by ~~this, whereby the~~ said tubular spring, said fluid forms a heat conducting bridge through openings of the tubular spring between the actor body and the injector housing.

4. (withdrawn) Injector according to Claim 1, wherein the actor body is incorporated into an axial encapsulation positioned in the space which divides the space into an actor internal space and an actor external space hydraulically sealed against it, whereby the actor internal space forms at least a part of the fluid space and is filled with fluid over at least a part of its length.

5. (withdrawn) Injector according to Claim 4, wherein

the actor external space is filled over at least a part of its length with a second heat coupling fluid.

6. (withdrawn) Injector according to Claim 5, wherein a dynamic hydraulic bearing rigidly supporting the actor body on a side away from the valve needle is provided, the hydraulic support and actor external space are hydraulically connected and are filled with a hydraulic liquid serving as a second heat coupling fluid, and a sealing element is provided in which the actor external space is sealed against a space adjacent to the injector valve (V) in the injector housing.

7. (withdrawn and currently amended) Injector in accordance with claim 4, wherein
~~characterized in that~~ the encapsulation is formed by an axially flexible metal bellows and that the actor body is pretensioned by this.

8. (previously presented) Injector in accordance with claim 1, wherein
the actor body is in direct contact with the fluid over its entire length and the volume of the air reservoir is connected without any hydraulic restriction with the fluid-filled part of the fluid space.

9. (previously presented) Injector according to Claim 8, wherein

an elastic membrane is provided between the air reservoir and the fluid-filled part of the fluid space.

10. (withdrawn) Injector in accordance with claim 1, wherein

the injector housing features holes for electrical connecting leads of the actor and at least one of these holes is provided as a filling channel for the fluid space.

11. (previously presented) Injector in accordance with claim 1, wherein the

heat coupling fluid has a high dielectric constant.

12. (currently amended) Injector in accordance with claim 1, wherein the piezoelectric actor body has ~~multiplayer~~ multilayer design.

13. (new) A fuel injector, comprising:

a piezoelectric actor body;

an injector housing surrounding said actor body so as to define an intermediate space between said injector housing and said actor body; and

an inert, non-electrically conductive fluid sealedly contained within said intermediate space,

wherein said intermediate space is filled with said fluid except for an air reservoir, so that said actor body is in direct contact with the fluid over at least part of its length, said fluid removing heat from the actor body so that said actor body is cooled by the fluid.

14. (new) The fuel injector according to Claim 13, further comprising a separation member provided in an area of a valve-side end of the actor body, said separation member seals the fluid-filled part of the intermediate space against a space adjacent to an injector valve in the injector housing.

15. (new) The fuel injector according to Claim 14, further comprising a tubular spring in the intermediate space and surrounding the actor body, said tubular spring pretensioning said actor body, said fluid forming a heat conducting bridge through openings of the tubular spring between the actor body and the injector housing.

16. (new) The fuel injector in accordance with claim 13, wherein said injector housing includes holes for connecting electrical leads to said actor body, at least one of said holes being provided as a filling channel for the intermediate space.

17. (new) The fuel injector in accordance with claim 13, wherein the fluid has a high dielectric constant.

18. (new) The fuel injector in accordance with claim 1, wherein the piezoelectric actor body has multilayer design.

19. (new) An injector for use as a fuel injection valve of motor vehicles, comprising:

a piezoelectric actor body having a jacket surface surrounded by an injector housing so as to define a sealable intermediate space therebetween, said actor body being cooled by direct contact with an inert liquid which does not conduct electricity,

said intermediate space being filled with the inert liquid except for an air reservoir, so that said actor body is in direct contact with the inert fluid over at least part of a length of said actor body, the inert fluid removing heat from the actor body in a lateral direction from the actor body, a volume of the air reservoir being at least as large as to allow the expansion of the inert fluid which occurs at the highest operating temperature of the actor body.

20. The injector in accordance with claim 19, wherein the liquid is one of silicon oil and glycerin.